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# ***The Gender Earnings Gap: Evidence from the UK***

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## **I. INTRODUCTION**

Rising female labour-force participation has been one of the most striking changes to have occurred in industrialised countries' labour markets over recent decades. In the UK between 1973 and 1993, female labour-force participation rose from 57 per cent to 68 per cent for women aged 16 to 64.<sup>2</sup> Women now account for half of all employees and 36 per cent of those working full-time (compared with 38 per cent and 30 per cent respectively in 1971).<sup>3</sup> Yet, although women have been the main beneficiaries from the creation of new jobs, they have still not gained earnings parity with men. For women working full-time, however, the pay gap has been closing, and the New Earnings Survey reports a rise in the ratio of median hourly pay of full-time women to men from 65 per cent in 1970 to 73 per cent in 1976 and a more gradual increase thereafter to 80 per cent in 1994. In contrast, the relative earnings position of women working part-time has changed little for over two decades.

Our period of study (the mid-1970s to the early 1990s) saw significant shifts in the composition of female employment that are potentially important in explaining changes in the gender gap. First, there has been a notable increase in the average age of full-time working women which has primarily resulted from increased employment amongst women of child-bearing age. This has shifted the

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<sup>2</sup> Source: *OECD Labour Force Statistics*, 1993.

<sup>3</sup> Sources: *Employment Gazette*, June 1995; *Employment Gazette Historical Statistics*, October 1994.

age profile of full-time women closer to that of working men. Part-time employment, however, still continues to be dominated by older women. The second major compositional change is in education. In the 1970s, female employees, whether working full-time or part-time, were much less well qualified than their male counterparts. Part-time working women were, however, as well qualified as those working full-time once age differences were accounted for. By the 1990s, full-time working women had markedly improved their educational attainment *vis-à-vis* men, with the qualifications gap completely disappearing for those under the age of 35. In contrast, part-timers continued to lag considerably behind male employees and were now also much less qualified than full-time working women (even after accounting for age differences). A third important compositional change relates to the presence of children in working women's households. In spite of increased employment rates amongst women with children, we find a fall in the proportion of working women with children. From the mid-1970s to the early 1990s, the proportion of full-time working women with a dependent child in the household fell from almost one-third to one-fifth. For part-time working women, this decline was from two-thirds to just over one-half.<sup>4</sup>

As women have improved their relative employment status, a number of other major changes have taken place in the labour market. Two of the most significant changes for any analysis of the change in the gender earnings gap are the rise in wage inequality and the shifting structure of demand for labour. The rapid rise in male wage inequality since the late 1970s has been well documented by, amongst others, Gosling, Machin and Meghir (1994), Gregg and Machin (1994) and Schmitt (1995), although little work has been done on female wage inequality. Changes in the structure of labour demand have been documented by Machin (1996), revealing a shift in labour demand away from the manufacturing sector towards the service sector. This is supported by figures from the *Employment Gazette* that indicate a fall in the manufacturing sector's share of total employment from 36 per cent in 1971 to 20 per cent in 1994. Over the same period, the service sector's share of total employment grew by 20 percentage points to account for 73 per cent of employment at the end of 1994. It has been argued that this shift in demand has tended to favour women (see, for example, Borooah and Lee (1988) and Sloane and Theodossiou (1994)).

This paper uses data from the Family Expenditure Survey (FES), General Household Survey (GHS) and British Household Panel Survey (BHPS) to provide a detailed account of the changing relative earnings position of women over the last two decades. We pay particular attention to the impact of rising wage inequality on women's relative earnings because, as increased wage inequality reduces the relative earnings of groups of workers with below-average labour market skills and as women typically have fewer formal labour market

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<sup>4</sup> Sources: General Household Survey 1977 and British Household Panel Survey 1991-92.

skills than men, rising wage inequality has a disproportionately negative effect on women's earnings, leading, *ceteris paribus*, to a fall in the gender earnings ratio.<sup>5</sup> This fall in the gender earnings ratio is not a result of gender-specific changes — for example, as a result of a widening of the skills gap or a rise in sex discrimination. Further, any increase in wage inequality may disguise improvements in women's labour market position as a result of gender-specific factors acting alone — for example, as a result of a narrowing in the skills gap or a reduction in sex discrimination. Thus, if we are to assess changes in women's relative labour market status accurately, we must distinguish between changes in the gender earnings ratio that have resulted from gender-specific changes and changes that have resulted from rising wage inequality.

This paper is structured as follows. Section II reviews changes in the gender earnings gap for all, full-time and part-time workers over the last two decades. Section III then goes on to look at changes in the levels and distribution of male and female earnings over the same period. In Section IV, we assess the implication of differences in earnings growth across the wage distribution for the gender earnings ratio. Section V, by looking at changes in the position of women in the male wage distribution over time, provides alternative measures of how well women are doing *vis-à-vis* men in the labour market. Sections II to V all use data from the FES. In Section VI, we attempt to shed some light on the factors behind these changes, by looking at changes in the composition of male and female employment and at changes in returns to labour market characteristics. Finally, in Section VII, by performing simple decompositions, we assess how much of the change in the gender earnings gap has resulted from changes in the composition of employment and how much has resulted from changes in returns to characteristics. Sections VI and VII employ data from the GHS and the BHPS. Wages are defined as including overtime. Throughout, we look at changes in the relative earnings position for all working women and separately for those working full- and part-time. Women are defined as working full-time if they work more than 30 hours a week.

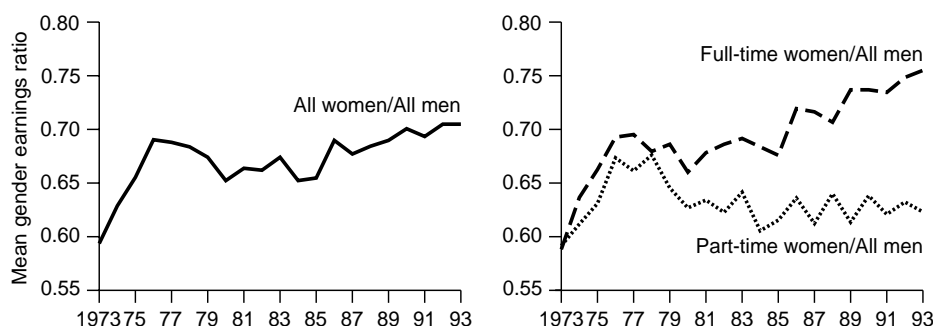
## **II. THE GENDER EARNINGS RATIO: AGGREGATE TRENDS**

The last two decades have seen a significant increase in the average earnings of women relative to men. The panel on the left of Figure 1 charts the change in the ratio of female to male average hourly earnings between 1973 and 1993. Between 1973 and 1993, female average hourly wages rose from 59 per cent of the male average to 71 per cent. This increase was concentrated around two periods: the early to mid-1970s (prior to and following the introduction of the Equal Pay and Sex Discrimination Acts in December 1975) and the mid-1980s.

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<sup>5</sup> See Blau and Kahn (1992) for a more detailed exposition of this argument.

FIGURE 1  
Changes in the Gender Earnings Gap



Source: Family Expenditure Survey

Analysing the experience of full- and part-time working women separately reveals markedly different trends. The right-hand panel of Figure 1 plots the ratio of full- and part-time female average earnings to average male earnings from 1973 to 1993. For full-time women, the gender earnings ratio rose from 59 to 77 per cent between 1973 and 1993. Much of this change occurred around the time of the introduction of the Equal Pay and Sex Discrimination Acts, with the ratio rising to 70 per cent between 1973 and 1977. Between 1977 and the late 1980s, there was little or no further improvement in the gender earnings ratio for full-timers, but the end of the 1980s and early 1990s once again saw the ratio climb, to reach 77 per cent in 1993.

The experience of part-time women workers has been in sharp contrast to that of full-timers. As Figure 1 illustrates, between 1973 and the early 1980s, the gender earnings ratios for women working full- and part-time were very similar. As with full-timers, the relative earnings of female part-timers rose rapidly prior to and following the introduction of the Equal Pay and Sex Discrimination Acts (from 59 to 67 per cent between 1973 and 1977). However, this increase was reversed in the late 1970s / early 1980s, and in 1984 the average earnings of part-time working women were equal to only 61 per cent of male average earnings. Throughout the rest of the 1980s and early 1990s, part-time women saw no further gain in their earnings relative to men, while they experienced a substantial drop in earnings relative to full-time working women. In 1993, the mean hourly pay of part-time women was equal to only 63 per cent of the male mean.

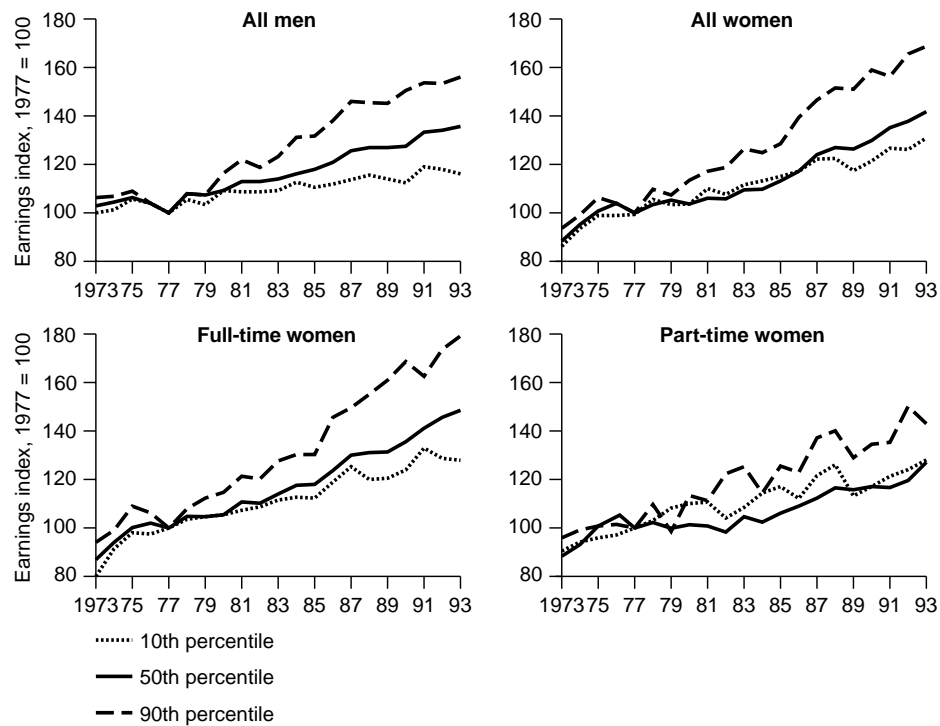
As a very small proportion of men work part-time, we have chosen to compare the earnings of part-time women with those of all men throughout the paper. It is instructive to note, however, that there is also a significant pay gap between part-time women and part-time men. In the 1970s and early 1980s, the

part-time female / part-time male pay gap was very similar to the part-time female / all male gap. The latter half of the 1980s and the early 1990s, however, saw a sharp decline in part-time men's relative pay, and this led to a rise in the part-time female / part-time male ratio, which reached around 75 per cent in the early 1990s.

### III. CHANGES IN EARNINGS

Real female hourly earnings have grown much faster than male earnings over the last two decades: between 1973 and 1993, real male average hourly earnings grew by 38 per cent compared with a 64 per cent increase for all working women. This fast growth rate of women's relative earnings can be attributed to the experience of full-time female workers, who realised a 79 per cent increase in average earnings over the period compared with a rise of just 46 per cent for part-timers.

FIGURE 2  
Earnings Growth for 10<sup>th</sup>, 50<sup>th</sup> and 90<sup>th</sup> Percentile



Source: Family Expenditure Survey

It is possible that these changes in average earnings may disguise large variations in the experience of workers at different points of the earnings distribution. It is therefore useful to look at real earnings growth for men and women at different points of the distribution. Figure 2 plots indexed real hourly earnings for men and women at the 10th, 50th and 90th percentiles between 1973 and 1993. As the experience of full- and part-time working women has differed so widely, we also plot earnings growth for women at the same percentiles in the full- and part-time wage distributions separately. The base year used is 1977 because the distribution of earnings between these percentiles narrowed between 1973 and 1977 and widened thereafter.

Between 1977 and 1993, the patterns of earnings growth for all working women and for men are similar across percentiles, with the earnings of the 90th percentile man (woman) growing notably faster than those of the 50th percentile man (woman), and the earnings growth of the 50th percentile man (woman) being significantly greater, in turn, than that of the 10th percentile man (woman). For full-time working women, earnings growth shows a similar dispersion across percentiles, although the earnings of full-time working women grew faster than male earnings at each percentile. Part-time working women also fared better than men, although they did much less well than those working full-time. Table 1 reports the earnings growth rates for these percentiles between 1973 and 1993 for men and full- and part-time working women.

These differences in earnings growth rates by percentile reflect a widening of the income distribution. More formal measures of earnings inequality are given in Table 2, which reports three alternative measures of wage inequality in 1973, 1983 and 1993. The reported measures differ in that they attach different weights to individuals within the wage distribution. For example, the coefficient of variation, defined as the variance of the wage divided by the mean, gives a high weighting to those at the top of the earnings distribution. By using logs, the weight attached to those at the top of the distribution is reduced and that attached to those at the bottom increased. The standard deviation of logs therefore gives an indication of wage dispersion with a more equal weighting being attached to those on very low and very high incomes. The Gini coefficient is a measure that compares the proportion of cumulative total earnings held by individuals at each

TABLE 1  
**Earnings Growth 1973-93 for the 10<sup>th</sup>, 50<sup>th</sup> and 90<sup>th</sup> Percentile**

	All men	Full-time women	Part-time women
10 <sup>th</sup> percentile	18	62	38
50 <sup>th</sup> percentile	33	72	42
90 <sup>th</sup> percentile	49	93	50

TABLE 2  
Inequality Measures of Hourly Earnings and Their Changes over Time

Inequality Measures of Hourly Earnings	1973				1983				1993			
	Men	All women	Full-time women	Part-time women	Men	All women	Full-time women	Part-time women	Men	All women	Full-time women	Part-time women
Coefficient of variation	0.598	0.621	0.461	0.771	0.584	0.675	0.486	0.857	0.656	0.657	0.539	0.813
Standard deviation of logs	0.482	0.462	0.434	0.492	0.497	0.497	0.457	0.529	0.562	0.528	0.514	0.518
Gini coefficient	0.260	0.266	0.238	0.295	0.272	0.283	0.246	0.315	0.308	0.294	0.273	0.304
Changes in Inequality Measures of Hourly Earnings	1973–83				1983–93				1973–93			
	Men	All women	Full-time women	Part-time women	Men	All women	Full-time women	Part-time women	Men	All women	Full-time women	Part-time women
Coefficient of variation	–2%	9%	5%	11%	12%	–3%	11%	–5%	10%	6%	17%	5%
Standard deviation of logs	3%	8%	5%	8%	13%	6%	12%	–2%	17%	14%	18%	5%
Gini coefficient	5%	6%	3%	7%	13%	4%	11%	–3%	18%	11%	15%	3%

Source: Family Expenditure Survey.

point of the earnings distribution with the proportion that would be held were earnings equally distributed.

All three measures show an increase in wage inequality between 1973 and 1993 for men and women. In 1993, the standard deviation of logs and the Gini coefficient indicate that wage inequality is lower amongst women than men, while in 1973, the standard deviation of logs indicates a slightly lower and the Gini coefficient a slightly higher level of wage inequality amongst women than men. The coefficient of variation (which attaches a high weight to those on high incomes), however, indicates that wage inequality is marginally greater between all working women than it is between all working men in both years. All measures indicate a faster rate of increase in wage inequality among men than among women.

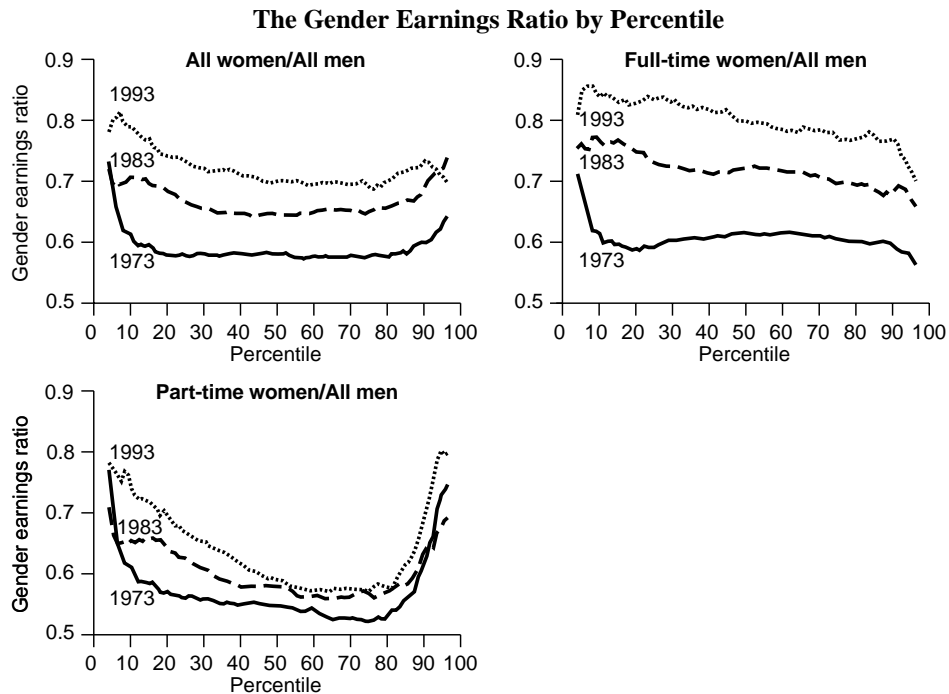
As before, separate analysis of full- and part-time working women reveals notably different trends. For full-time working women, all measures of wage inequality indicate a lower level of dispersion than that persisting amongst men in 1973, 1983 and 1993. The rate of increase in wage inequality (given by the percentage change) between 1973 and 1993 for female full-timers was, however, almost as great as or greater than the rate of increase for men. The experience of part-time women has again contrasted with that of full-timers. In 1973, the level of wage inequality amongst women working part-time was much greater than that that persisted amongst men. By 1993, however, only the coefficient of variation (which attaches a high weight to high earners) produced a measure of wage inequality greater for part-time working women than for men, while the standard deviation of logs and the Gini coefficient both indicated a marginally lower level of wage inequality. Also of note is that wage inequality amongst part-timers did not increase over the period, in sharp contrast with the experience of men and full-time working women.

#### **IV. CHANGES IN THE GENDER GAP ACROSS THE WAGE DISTRIBUTION**

Differences in rates of earnings growth across the wage distribution may mean that the gender earnings ratio has improved more at some points of the wage distribution than at others. For example, the top 10 per cent of female earners may have gained a great deal relative to the top 10 per cent of men, while the bottom 10 per cent may have seen only a marginal gain. To see how rising wage inequality has affected women at different points of the wage distribution, we examine changes in the wage gap at different percentiles of the male and female wage distribution. The first panel of Figure 3 shows the gender earnings ratio at each percentile (calculated as, for example, the ratio of the earnings of the 10th percentile woman to the earnings of the 10th percentile man) for all women in 1973, 1983 and 1993. The second and third panels show the same thing for women working full- and part-time. Looking at the first panel in Figure 3, we



FIGURE 3



Source: Family Expenditure Survey

can see that the gender earnings ratio is fairly flat across percentiles in all three periods, and that there has been an upward shift in the gender earnings ratio across the entire distribution between 1973 and 1983, and between 1983 and 1993. Analysing trends for full- and part-time working women separately again indicates divergent trends. For full-time working women, the gender earnings ratio rises at all percentiles between 1973 and 1993. However, while in 1973 the ratio was flat across the distribution, by 1993 there is a steady fall in the gender earnings ratio as we move up the earnings distribution. This suggests that women at the bottom of the distribution have gained (or men at the bottom have lost) most relative to men (women) at comparable percentiles of the male (female) distribution.

For women working part-time, the gender earnings ratio is similar to that for full-timers across the distribution in 1973, but by 1993, women working part-time have fallen significantly behind those working full-time. In 1993, the gender earnings ratio for women at the bottom of the part-time earnings distribution was substantially higher than that for women further up the distribution. Women in the very top part-time earnings decile, however, did well compared with men at an equivalent point of their earnings distribution. These

women were more likely to be professional workers and were more highly educated than other part-time workers. Noteworthy, too, is that while the gender earnings ratio has increased for the lowest-earning 50 per cent of part-timers, there has been little change in this ratio for women further up the distribution.

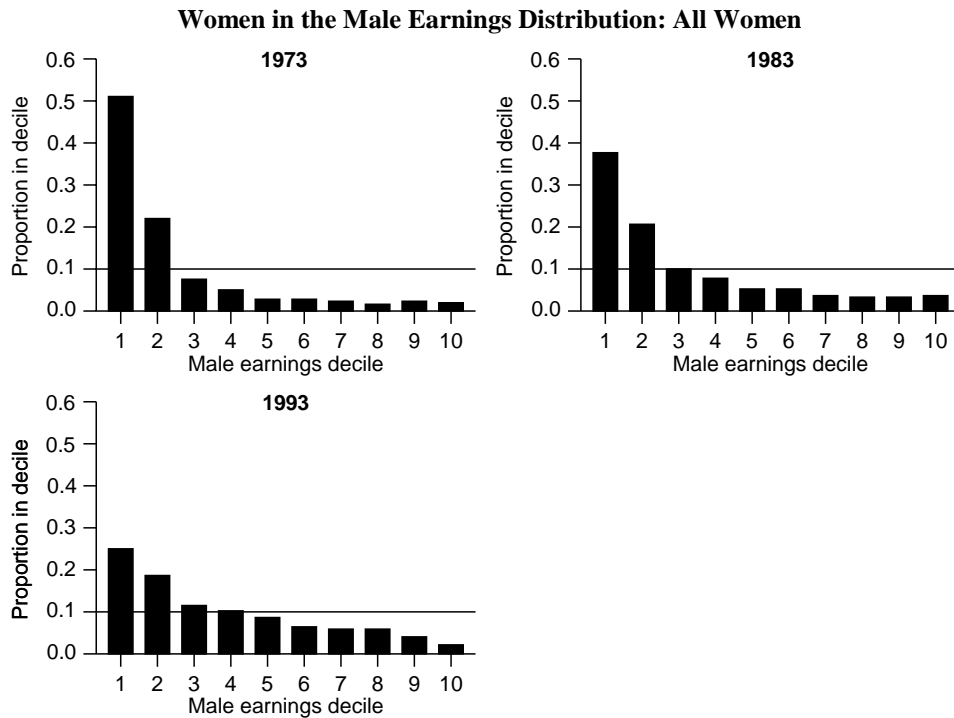
## **V. WOMEN IN THE MALE WAGE DISTRIBUTION**

So far, we have used comparisons of male and female earnings to assess changes in the labour market status of women over the last 20 years. Blau and Khan (1992), however, suggest that comparisons of male and female earnings may not be the best indicator of changes in the relative labour market position of women in a period of rapidly-rising wage inequality. This is because if, for example, returns to 'skill' rise, then women, because they have on average fewer labour market skills than men, will see a fall in their relative earnings. Thus, while rising wage inequality disproportionately penalises women, the resulting fall in the mean gender earnings ratio does not reflect a deterioration in the relative labour market position of women as a result of gender-specific factors (for example, a fall in the skills gap or a reduction in discrimination). Further earnings comparisons may understate any improvement in women's relative labour market position resulting from gender-specific changes in a period of rapidly-increasing wage inequality.

Given rapidly-increasing wage inequality, a better indicator of changes in the relative labour market status of women may be given by examining changes in the position of women in the male wage distribution. One method of doing this is to look at the distribution of female workers by male earnings deciles. A second method is to examine the percentile ranking of women in the male wage distribution.

Looking first at the distribution of female workers by male earnings decile, Figure 4(a) illustrates the ranking of all working women in the male earnings distribution in 1973, 1983 and 1993 using hourly earnings data from the Family Expenditure Survey (FES). The  $x$ -axis plots male earnings deciles and the  $y$ -axis plots the proportion of women in each of these deciles in each period. The line at 0.1 indicates the proportion of women we would expect to find in each decile if women had the same earnings distribution as men. In 1973, women were heavily concentrated in the bottom of the male earnings distribution, with over 50 per cent earning a wage less than or equal to that of the 10th percentile man and almost 90 per cent earning less than median male earnings. Only 2.3 per cent of women earned an amount greater than the amount earned by the 90th percentile man. Some improvement in the position of women in the male wage distribution occurred between 1973 and 1983, but the biggest change occurred between 1983 and 1993. By 1993, women had improved their position in the male wage distribution relative to their 1973 position dramatically, with the proportion of women in the bottom male earnings decile falling to 25 per cent. However, 75

FIGURE 4(a)

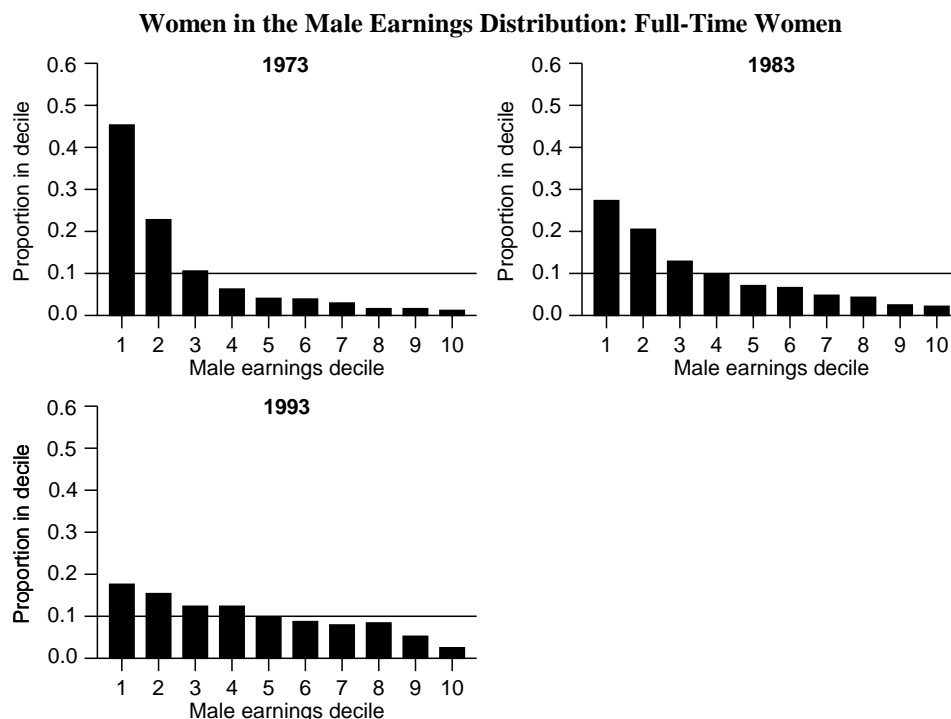


Source: Family Expenditure Survey

per cent of women still fell within the bottom half of the male earnings distribution and there was virtually no increase in the proportion of women in the top earnings decile. In 1993, just 2.5 per cent of women earned more than the 90th percentile man.

Once again, the experience of full- and part-time workers has varied markedly, as reflected in Figures 4(b) and 4(c). Women working part-time in all periods were more likely than those working full-time to fall within the lowest male earnings decile, and while women working full-time have seen a significant improvement in their earnings position in the last two decades, the change for women working part-time has been much less dramatic. For full-timers, the FES hourly earnings data indicate that, in 1973, over 45 per cent of full-time female employees had earnings in the bottom male earnings decile and 88 per cent earned less than the male median. Just 1.3 per cent of women had made it into the top male earnings decile. Between 1973 and 1993, there was a significant improvement in the earnings position of women in the male wage distribution. By 1993, the proportion of women in the bottom male earnings decile had fallen to 17 per cent and the proportion earning less than the male median had fallen to 67 per cent. There remains, however, significant under-representation of women

FIGURE 4(b)

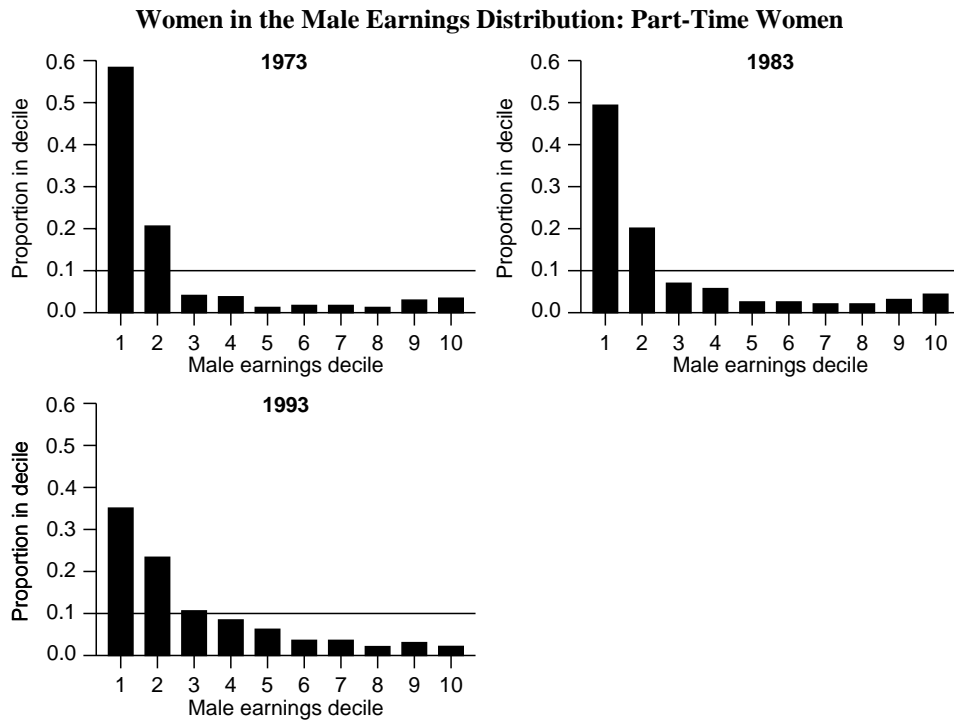


Source: Family Expenditure Survey

in the very top earnings deciles: in 1993, only 2.4 per cent of full-time working women made it into the top decile. For part-time working women, the picture is very different, with these women having seen much less improvement in their relative earnings position over the last two decades. Part-time women remain considerably over-represented in the bottom male earnings decile, although the proportion falling within this decile did drop substantially between 1973 and 1993, from 58 to 35 per cent. Part-timers are, however, still massively over-represented in the bottom half of the male earnings distribution: in 1993, 84 per cent of part-timers earned less than the male median, compared with 88 per cent in 1973. It is noteworthy, too, that *about* the same proportion of part-time working women as full-timers made it into the top male earnings decile: around 3 per cent in 1993 in both cases.

Another way of looking at the changing position of women in the male wage distribution while accounting for changes in the wage structure is to assign women a percentile ranking according to the position of their earnings in the male wage distribution. Changes in the position of the percentile ranking of, for example, the median woman in the male wage distribution can then be computed over time. Figure 5 graphs changes in the percentile ranking of the median

FIGURE 4(c)

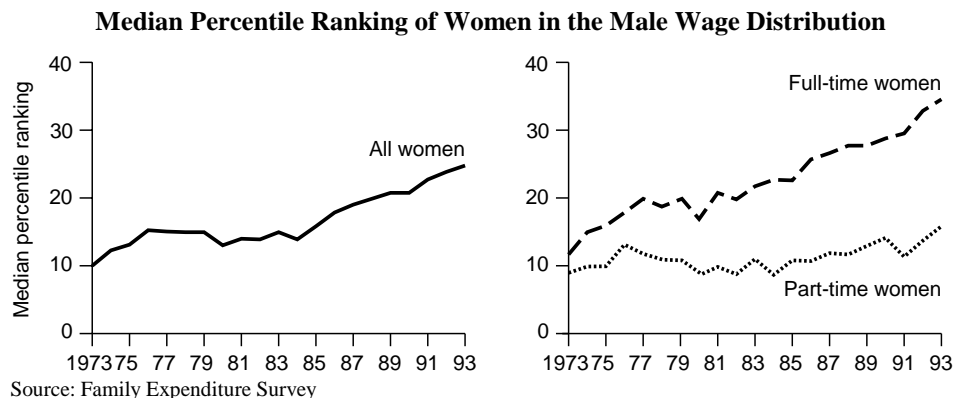


Source: Family Expenditure Survey

working woman in the male distribution over time, for all women and separately for those working full- and part-time. Unlike trends in the mean or median gender earnings ratio, the median woman's percentile ranking appears to be relatively flat from 1973 through to 1985, whereafter her ranking climbs steadily. In 1973, the median working woman earned an amount equivalent to the earnings of the 10th percentile man. This rose to the 15th percentile man in 1983 and the 25th percentile man in 1993. Again, trends differ for those working full- and part-time. For full-time working women, the median percentile ranking in the male wage distribution rose from the 12th percentile in 1973 to the 22nd in 1983 and the 35th in 1993. Part-timers did not fare so well, with their median percentile ranking increasing only from the 9th to the 16th percentile between 1973 and 1993.

Using the median percentile ranking of women, we can calculate what the median wage gender earnings ratio would have been in 1993 if women's position in the male wage distribution had not changed since 1973. In 1973, the median woman had earnings equal to those of the 10th percentile man and the median wage gender earnings ratio was 58 per cent. By 1993, the median wage gender earnings ratio had risen to 71 per cent and the median woman's percentile

FIGURE 5



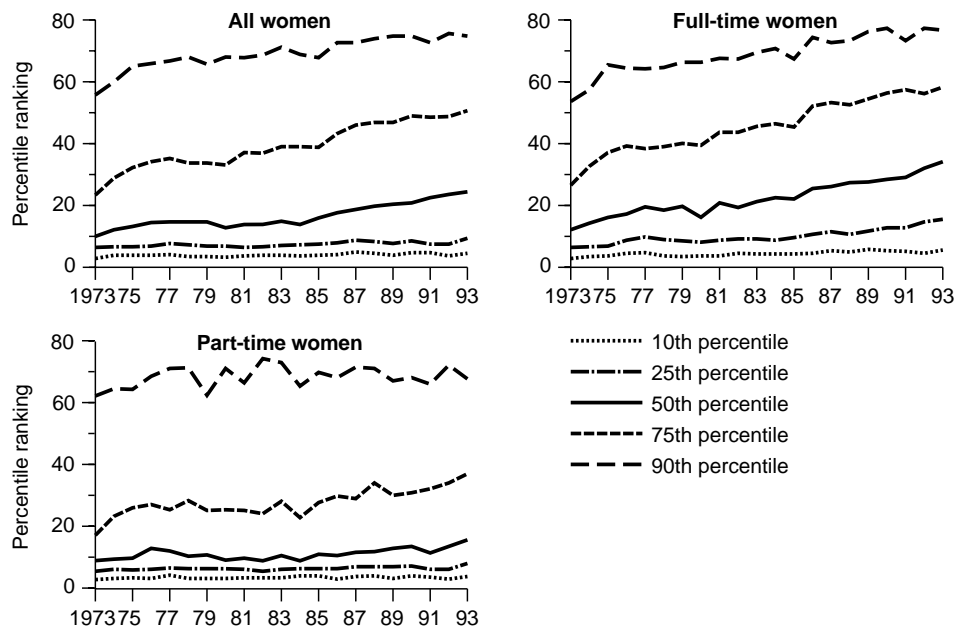
ranking to the 25th percentile. Had the median woman's percentile ranking remained at the 10th percentile, however, the median wage gender earnings ratio would actually have fallen to 51 per cent. This indicates that gender-specific factors (for example, reduced discrimination or skills catch-up) alone worked towards closing the pay gap while changing wage structures inhibited this process. It also illustrates that failing to account for changes in the wage structure (for example, by using mean or median data) in periods of rising wage inequality understates the extent to which women have improved their relative labour market position as a result of gender-specific changes.

It is possible to extend our analysis to examine how women at different points of the wage distribution have fared, using similar methodology. Figure 6 plots the percentile ranking of the 10th, 25th, 50th, 75th and 90th percentile women between 1973 and 1993, and Table 3 reports this ranking for 1973, 1983 and 1993. What is clear is that, for both full- and part-time working women across the earnings distribution, changes in the ranking of women in the male wage distribution suggest a significantly greater improvement in their relative labour market status than is indicated by comparisons of raw earnings data.

## VI. EXPLAINING THE CHANGE IN THE GENDER EARNINGS GAP: CHANGES IN THE COMPOSITION OF EMPLOYMENT AND RETURNS TO CHARACTERISTICS

The last two decades have seen marked changes in the labour market's composition and in returns to measured labour market skills. This section details these changes using data from the General Household Survey (GHS) for 1974 and 1983 and the British Household Panel Survey (BHPS) for 1992-93. The GHS is chosen for 1974 and 1983 because it is the only dataset available for this period reporting hourly earnings and including detailed information on personal

FIGURE 6  
Changes in the Percentile Ranking of the 10th, 25th, 50th,  
75th and 90th Percentile Women



Source: Family Expenditure Survey

TABLE 3  
Percentile Ranking in the Male Wage Distribution of Women at the 10th, 25th, 50th,  
75th and 90th Percentile of the Female Wage Distribution: All, Full- and Part-Time  
Women

	All women			Full-time women			Part-time women		
	1973	1983	1993	1973	1983	1993	1973	1983	1993
10 <sup>th</sup> percentile	3	4	5	3	5	6	3	3	4
25 <sup>th</sup> percentile	6	7	10	6	9	16	5	6	8
50 <sup>th</sup> percentile	10	15	25	12	22	35	9	11	16
75 <sup>th</sup> percentile	23	39	51	27	46	59	17	28	37
90 <sup>th</sup> percentile	56	71	75	54	70	78	62	73	68

Source: Family Expenditure Survey

characteristics. Unfortunately, 1983 is the last year for which we can derive a consistent measure of hourly earnings from the GHS. The BHPS, which includes a similar set of information to the GHS but is only available from 1991-92, is therefore used for 1992-93. In Section VII, we go on to assess the impact of changing labour market structures and returns to measured labour market skills on the gender earnings gap using simple wage equations. The explanatory variables of interest to us available from these datasets are age, education, region, single-digit industrial and occupational classifications, presence of children and, in 1983 and 1992-93 only, employer size and union status. In 1992-93, years of full-time and part-time previous work experience are also available.

### *1. Changes in Female Employment Rates and Composition by Age*

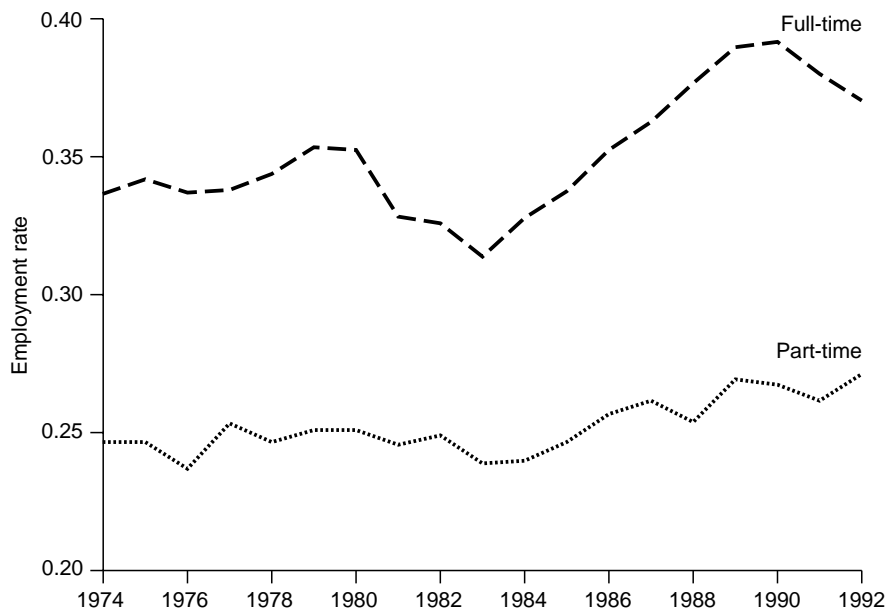
Figure 7 plots full- and part-time employment rates for women aged 16 to 60 between 1974 and 1991-92. In 1974, 34 per cent of women of working age were in full-time employment and 25 per cent were employed part-time. The biggest change in female employment between 1974 and 1991-92 was among full-timers, with the proportion of women in full-time employment rising five percentage points to 39 per cent between 1974 and 1990, but then falling back to 37 per cent in 1991-92. Over the same period, the proportion of women working part-time saw a small (two percentage point) increase to 27 per cent in 1991-92.

While these changes are fairly small, they disguise bigger swings in employment rates among different age-groups. In Figure 8, full-time and part-time employment rates are plotted for four age-groups from 1974 to 1991-92. The first panel shows full- and part-time employment rates for those aged 16 to 24. Women of this age have always had higher rates of full-time employment and lower rates of part-time employment than other women. For these women, part-time employment showed a small increase and full-time employment a decrease between 1974 and 1991-92. These changes are probably a result of increased rates of participation in higher education. Of more interest are changes in employment among older women. The second panel of Figure 8 shows changes in participation among women aged 25 to 34. These women have seen the most rapid increase in full-time employment over the period, with the proportion employed full-time rising from 27 to 38 per cent. The proportion working part-time remained constant at 25 per cent. From the third panel, we can see that women aged 35 to 49 have also seen a significant rise in full-time employment, from 30 to 38 per cent, but little change in part-time employment (33 and 34 per cent in 1974 and 1991-92 respectively). Finally, for women over 50 (the fourth panel), there has been little change in the full-time employment rate (around 30 per cent worked full-time in both 1974 and 1991-92), while part-time employment has shown only a small increase over the period (from around 25 per cent to 30 per cent).



FIGURE 7

**Changes in Full- and Part-Time Employment Rates: Women Aged 16 to 60**



Source: Family Expenditure Survey

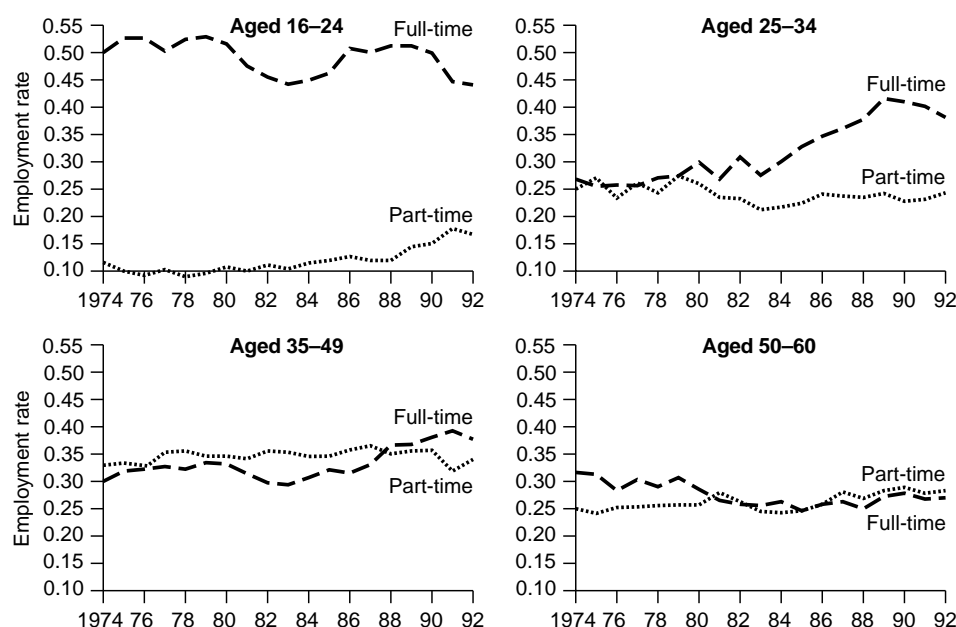
These differences in changes in employment rates by age have led to a significant shift in the age composition of female employment. This is reported in Table 4, in which figures are presented for working men and (both full- and part-time) women by four age-groups for two sub-periods (1974-76 and 1990-92). In 1974-76, a relatively high proportion of women working full-time were under 25, while relatively few full-timers fell between the ages of 25 and 34. By 1990-92, increased full-time employment rates amongst women aged 25 to 34 shifted the age profile of full-time female employees so that it was much closer to that of working men. In 1974-76 and 1990-92, the age composition of part-timers differed significantly from that of both full-time working women and men, with a much higher proportion of part-time working women being over the age of 35.

## *2. Other Changes in the Composition of Female Employment*

Table 4 also reports summary statistics from the GHS on the distribution of employees by educational attainment. It should be noted here that our education categories are degree or equivalent, A level or equivalent, etc., and include vocational qualifications. It is clear that in 1974-76, female employees in all age-groups, whether working full- or part-time, were much less well qualified than

FIGURE 8

## Changes in Women's Full- and Part-Time Employment rates by Age



Source: Family Expenditure Survey

their male counterparts (although the difference in educational attainment was significantly lower for younger workers). Also noteworthy is that in 1974-76, after account is taken of differences in the age composition of full- and part-time female employees, women working part-time were at least as well qualified as women working full-time.

Between 1974-76 and 1990-92, the educational attainment of women working full-time had improved markedly *vis-à-vis* men. Amongst under-35s, in 1990-92, there was little difference in the proportion of men and full-time working women with a degree or higher qualification, while a significantly larger proportion of men had no qualifications. Full-time working women over 35 remained less well qualified than their male counterparts, but the gap in 1990-92 was small and considerably lower than it had been in 1974-76. For women working part-time, the story is quite different. By 1990-92, women working part-time, although better educated than they had been in 1974-76, lagged considerably behind both male and full-time female employees even after accounting for differences in age composition.

The composition of employment by industry and occupation has also undergone significant change since the 1970s, with more female employees working in the service sector and in higher-grade non-manual occupations by the

TABLE 4  
Composition of Employment by Education and Age

	1974–76				1990–92			
	<i>Men</i>	<i>All women</i>	<i>Full-time women</i>	<i>Part-time women</i>	<i>Men</i>	<i>All women</i>	<i>Full-time women</i>	<i>Part-time women</i>
<i>All aged 16–59</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Degree / Higher	10.4	6.9	7.8	8.8	23.1	16.1	23.2	14.3
A levels or 5+ O levels	19.3	11.3	12.7	9.2	27.3	20.8	24.1	19.4
1–4 O levels or equivalent	19.9	20.0	24.8	16.4	20.6	29.2	30.7	29.4
No qualifications	50.4	61.9	54.7	65.7	28.9	33.9	22.0	36.9
<i>Age 16–24</i>	21.2	19.8	30.5	8.2	19.8	19.5	23.8	12.2
Degree / Higher	5.7	4.8	4.9	11.9	9.9	7.7	11.6	4.3
A levels or 5+ O levels	34.2	22.5	21.4	27.0	42.8	39.5	40.1	48.0
1–4 O levels or equivalent	23.5	32.1	39.8	25.4	29.3	36.4	41.7	29.8
No qualifications	36.7	40.7	33.9	35.8	18.1	16.3	6.6	17.9
<i>Age 25–34</i>	24.5	24.6	18.7	25.0	25.6	25.8	26.7	22.6
Degree / Higher	15.2	9.7	13.2	10.5	27.9	19.4	30.8	15.8
A levels or 5+ O levels	23.5	12.3	14.7	10.5	30.2	23.3	27.5	22.5
1–4 O levels or equivalent	19.4	25.0	27.6	23.1	23.1	36.7	31.8	41.9
No qualifications	41.8	53.0	44.5	55.9	19.0	20.5	10.0	19.8
<i>Age 35–49</i>	32.1	31.9	29.7	42.7	34.2	34.5	34.8	43.7
Degree / Higher	11.4	7.7	8.9	8.9	28.8	19.6	26.1	17.3
A levels or 5+ O levels	14.4	8.2	7.5	7.8	23.8	14.4	15.7	14.4
1–4 O levels or equivalent	19.4	15.0	16.6	14.1	15.5	26.6	27.0	28.2
No qualifications	54.9	69.2	66.9	69.2	32.0	39.4	31.2	40.2
<i>Age 50–59</i>	22.3	23.7	21.2	24.1	20.4	20.2	14.7	21.5
Degree / Higher	8.2	6.5	6.1	6.9	20.0	13.5	20.0	12.2
A levels or 5+ O levels	7.8	3.7	4.5	2.9	16.3	11.4	14.0	11.1
1–4 O levels or equivalent	17.6	11.5	12.9	10.1	18.7	18.0	21.3	18.6
No qualifications	66.4	78.2	76.4	80.0	45.0	57.1	44.8	58.1

Source: General Household Survey.

early 1990s. It is noteworthy that women remain significantly over-represented in non-manual categories of employment and under-represented amongst skilled manual workers. Both full- and part-time employees are over-represented in these sectors and occupations, although concentration is greater for part-timers. Despite union decline (Disney, Gosling and Machin, 1995), women are also less likely to be union members and more likely to work in smaller firms (see Green, Machin and Manning (1996) for evidence on wage penalties received by women in smaller workplaces).

The presence of children in the household also has a strong impact on women's earnings. Recent decades have seen both a fall in the proportion of women having children and an increase in the average age at which women have their first child. In 1977, 31 per cent of women working full-time had a dependent child in the household and 4 per cent had a child under five. By 1992-93, declining fertility meant that only 21 per cent of women working full-time had a dependent child in the household. This was in spite of increased full-time employment rates amongst women with children. The proportion of full-timers with children under five rose, however, to 5 per cent, reflecting increasing acceptability of women with young children working. Among part-timers, the prevalence of dependent children has fallen too: in 1977, 62 per cent of part-timers had a dependent child in the household and 21 per cent had a child under five, compared with 53 and 13 per cent respectively in 1992-93. Finally, it is notable that the vast majority of women who worked part-time had at some time had dependent children (89 per cent in 1977 and 85 per cent in 1992-93, compared with 42 and 47 per cent of full-timers in 1977 and 1992-93 respectively).

### *3. Returns to Characteristics*

Changes in returns to characteristics are given by shifts in the coefficients derived from simple wage equations. Table 5(a) reports regression results for a simple hourly earnings function that includes a quadratic in age and education variables in 1974, 1983 and 1992-93, for all men and full- and part-time working women. In Table 5(b), results from a more fully specified wage equation that includes dummies for region, industry and occupation are reported. In Table 5(c), we include a dummy variable for the presence of children in the household, and in Table 5(d), we report results for 1983 and 1992-93 only for regressions that include dummies for whether there is a union at the workplace and for employer size (four categories). In 1992-93, we also add two quadratics in previous years of full- and part-time work experience.

The coefficients attained from the human capital specification (reported in Table 5(a)), and the changes in these coefficients over time, differ significantly for men and women. For men, we see a fall in returns to education and age between 1974 and 1983 and a rise between 1983 and 1992-93. This is as

TABLE 5(a)  
Regression Results: Human Capital Specification

	All men			Full-time women			Part-time women		
	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS
Age	0.096 (0.003)	0.089 (0.003)	0.099 (0.006)	0.063 (0.004)	0.061 (0.005)	0.099 (0.008)	0.042 (0.006)	0.047 (0.005)	0.033 (0.010)
Age <sup>2</sup> /100	-0.109 (0.004)	-0.097 (0.004)	-0.106 (0.007)	-0.073 (0.005)	-0.067 (0.006)	-0.118 (0.011)	-0.051 (0.007)	-0.053 (0.006)	-0.034 (0.011)
Degree	0.697 (0.026)	0.679 (0.023)	0.782 (0.034)	0.860 (0.050)	0.835 (0.034)	0.807 (0.043)	0.953 (0.163)	1.005 (0.098)	0.974 (0.110)
Higher	0.525 (0.021)	0.481 (0.019)	0.553 (0.040)	0.529 (0.032)	0.599 (0.032)	0.571 (0.054)	0.683 (0.056)	0.769 (0.045)	1.005 (0.080)
A levels	0.344 (0.018)	0.315 (0.020)	0.410 (0.030)	0.516 (0.052)	0.428 (0.031)	0.429 (0.044)	0.559 (0.109)	0.304 (0.095)	0.407 (0.059)
O levels	0.171 (0.012)	0.173 (0.014)	0.294 (0.028)	0.205 (0.018)	0.234 (0.020)	0.250 (0.037)	0.187 (0.031)	0.111 (0.022)	0.175 (0.032)
Constant	-0.552 (0.048)	-0.361 (0.061)	-0.529 (0.104)	-0.250 (0.065)	-0.066 (0.080)	-0.527 (0.145)	0.079 (0.121)	0.068 (0.095)	0.463 (0.192)
Sample size	5,671	4,211	1,934	2,386	1,971	1,171	1,976	1,646	829
R <sup>2</sup>	0.402	0.368	0.389	0.329	0.396	0.369	0.166	0.334	0.308

Note: Standard errors are given in parentheses.

expected, given the flattening of the wage distribution in the mid-1970s and the subsequent rise in wage inequality from the late 1970s (see also Schmitt (1995) or Gosling, Machin and Meghir (1994)). For women, the pattern of change is significantly different. Returns to age show a similar pattern of change for women working full-time, with returns to age falling between 1974 and 1983 and rising between 1983 and 1992-93. As with men, this reflects an increase in wage inequality amongst full-time working women. In contrast to the male experience, however, returns to education have shown a general decline since 1974. This may be because there was a substantial increase in pay, particularly amongst the lowest-paid women, following the introduction of the Equal Pay and Sex Discrimination Acts. Again, the experience of part-timers differs substantially from that of full-timers. For part-timers, returns to age have fallen, while returns to education show no distinct pattern of change over the period. Finally, the R<sup>2</sup>s show that, with one exception, between 30 and 40 per cent of the variation in log(wages) can be explained by the variables included in the human capital specification for full- and part-time working women and men in all periods.

TABLE 5(b)

**Regression Results: Human Capital, Industry, Occupation and Region**

	All men			Full-time women			Part-time women		
	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS
Age	0.087 (0.003)	0.079 (0.003)	0.085 (0.005)	0.061 (0.004)	0.058 (0.004)	0.090 (0.008)	0.040 (0.006)	0.046 (0.005)	0.025 (0.009)
Age <sup>2</sup> /100	-0.100 (0.003)	-0.086 (0.004)	-0.092 (0.007)	-0.070 (0.005)	-0.064 (0.006)	-0.107 (0.010)	-0.048 (0.007)	-0.052 (0.006)	-0.025 (0.011)
Degree	0.453 (0.028)	0.484 (0.026)	0.490 (0.037)	0.730 (0.055)	0.717 (0.039)	0.604 (0.042)	0.885 (0.162)	0.854 (0.094)	0.767 (0.117)
Higher	0.344 (0.022)	0.339 (0.020)	0.339 (0.043)	0.469 (0.034)	0.524 (0.034)	0.449 (0.051)	0.605 (0.059)	0.666 (0.046)	0.854 (0.080)
A levels	0.228 (0.018)	0.216 (0.020)	0.260 (0.029)	0.419 (0.051)	0.360 (0.031)	0.355 (0.042)	0.474 (0.113)	0.213 (0.080)	0.296 (0.059)
O levels	0.099 (0.011)	0.122 (0.014)	0.185 (0.026)	0.136 (0.018)	0.172 (0.022)	0.198 (0.034)	0.112 (0.030)	0.057 (0.022)	0.126 (0.032)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.736 (0.060)	-0.422 (0.076)	-0.331 (0.123)	-0.418 (0.133)	-0.687 (0.377)	-0.676 (0.250)	-0.109 (0.179)	-0.111 (0.121)	0.571 (0.195)
Sample size	5,671	4,211	1,934	2,386	1,971	1,171	1,976	1,646	829
R <sup>2</sup>	0.497	0.495	0.492	0.432	0.469	0.500	0.227	0.395	0.400

Note: Standard errors are given in parentheses.

In the Table 5(b) models, the reported R<sup>2</sup>s suggest that about 40 to 50 per cent of the variation in log(wages) can be accounted for by these explanatory variables for full-time working women and men. The regression's explanatory power for women working part-time is substantially lower, at only 23 per cent in 1974 and 40 per cent in 1983 and 1992-93. The observed changes in returns to age and education remain robust to the addition of these extra controls, and there is some additional evidence (not reported here) that the wage premium for professionals and managers has risen and that the wage penalty for unskilled manuals has become larger (in absolute terms).

The Table 5(c) models also include a dummy variable for the presence of children in the household, and again our results are robust to the addition of this control. We find that, for men, the coefficient on the children-in-household

dummy is small but positive and, in 1983 and 1992-93, statistically significant. In contrast, for full-time working women, the coefficient on the children dummy is large, negative and statistically significant in all years. However, the negative earnings effect associated with the presence of dependent children has been falling throughout the period. Interestingly, the negative coefficient on the children variable is smaller in absolute terms for women working part-time than it is for full-timers, suggesting that earnings penalties associated with working part-time are not a direct result of the presence of children.

TABLE 5(c)

**Regression Results: Human Capital, Industry, Occupation, Region and Children**

	All men			Full-time women			Part-time women		
	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS	1974 GHS	1983 GHS	1992-93 BHPS
Age	0.086 (0.003)	0.077 (0.003)	0.081 (0.005)	0.064 (0.004)	0.064 (0.004)	0.095 (0.008)	0.045 (0.006)	0.048 (0.005)	0.027 (0.010)
Age <sup>2</sup> /100	-0.099 (0.004)	-0.083 (0.004)	-0.087 (0.007)	-0.077 (0.005)	-0.072 (0.006)	-0.114 (0.010)	-0.056 (0.008)	-0.055 (0.007)	-0.028 (0.012)
Degree	0.454 (0.028)	0.486 (0.026)	0.493 (0.037)	0.701 (0.056)	0.707 (0.039)	0.596 (0.043)	0.878 (0.162)	0.852 (0.094)	0.766 (0.117)
Higher	0.344 (0.022)	0.339 (0.020)	0.340 (0.043)	0.469 (0.033)	0.521 (0.034)	0.448 (0.051)	0.606 (0.058)	0.667 (0.046)	0.854 (0.081)
A levels	0.229 (0.018)	0.218 (0.020)	0.260 (0.029)	0.401 (0.051)	0.358 (0.031)	0.344 (0.041)	0.466 (0.112)	0.213 (0.080)	0.295 (0.060)
O levels	0.099 (0.011)	0.122 (0.014)	0.183 (0.026)	0.131 (0.017)	0.172 (0.021)	0.198 (0.034)	0.115 (0.029)	0.058 (0.022)	0.126 (0.032)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Children in household	0.010 (0.010)	0.021 (0.011)	0.045 (0.019)	-0.125 (0.016)	-0.120 (0.018)	-0.100 (0.027)	-0.056 (0.028)	-0.018 (0.022)	-0.026 (0.042)
Constant	-0.731 (0.060)	-0.406 (0.077)	-0.271 (0.125)	-0.428 (0.139)	-0.764 (0.381)	-0.735 (0.243)	-0.136 (0.179)	0.098 (0.122)	0.561 (0.194)
Sample size	5,671	4,211	1,934	2,386	1,971	1,171	1,976	1,646	829
R <sup>2</sup>	0.497	0.496	0.494	0.448	0.482	0.502	0.228	0.395	0.401

Note: Standard errors are given in parentheses.

In the Table 5(d) models, we add dummy variables for establishment size and unionisation and two quadratics in years of full-time and part-time work experience. All these variables exert a significant impact on wages and improve the goodness of fit of the model (the  $R^2$ s indicate that our model now explains between 50 and 60 per cent of the variation in  $\log(\text{wages})$  for men and full-time working women, and between 40 and 50 per cent of the variation in  $\log(\text{wages})$  among part-timers). Our previous results remain robust to the addition of size and union controls, and we now observe that returns to the union-at-work dummy (a) have increased over time and (b) have a much greater impact on raising female than male earnings (whether the woman works full- or part-time). In 1992-93, the addition of two quadratics in years of full- and part-time work experience yields some interesting results. First, as expected, when we add years of work experience, the coefficients on the age variables are substantially reduced. Second, for full-time working women, the addition of the experience variables results in a significant drop in the negative coefficient on the children-in-household dummy. This suggests that the lower earnings of full-time women with children are at least partly explained by their associated loss of work experience. Finally, looking first at the coefficients on the full-time work experience variable, we can see that years of full-time work experience have a statistically significant positive impact on male and full- and part-time female earnings. This positive impact is greater for full-time women than for either men or part-time women. In contrast, the coefficients on the part-time experience variable are statistically insignificant for full-time working women and actually lead to a statistically significant fall in earnings amongst men and part-time working women.

Selection issues are potentially important in explaining changes in the gender earnings gap, but are not controlled for here. Selection problems arise where individuals are not randomly selected into part-time or full-time work. Instead, unobserved characteristics that affect, for example, the part-time female wage equation also affect the probability of a woman working part-time. Thus, if it were the case that women who chose to work part-time were less motivated than those who chose full-time work, we would also expect to see lower wages amongst part-timers even after we controlled for differences in observed characteristics. Harkness and Machin (1995) controlled for selection when looking at the full-time female / full-time male wage gap. They found no evidence of selection bias amongst full-time female employees in either 1977 or 1991. Ermisch and Wright's (1993) study of returns to characteristics in full- and part-time work, on the other hand, found evidence of significant sample selection bias into full-time work but no selection bias amongst part-timers in 1980.



TABLE 5(d)

**Regression Results: Human Capital, Industry, Occupation, Region, Children,  
Union at Work, Employer Size and Work Experience**

	All men		Full-time women		Part-time women		All men	Full-time women	Part-time women
	1983	1992-93	1983	1992-93	1983	1992-93	1992-93	1992-93	1992-93
	GHS	BHPS	GHS	BHPS	GHS	BHPS	BHPS	BHPS	BHPS
Age	0.072 (0.003)	0.073 (0.005)	0.057 (0.004)	0.083 (0.007)	0.041 (0.005)	0.019 (0.009)	0.056 (0.011)	0.050 (0.010)	0.018 (0.011)
Age <sup>2</sup> /100	-0.078 (0.004)	-0.078 (0.007)	-0.065 (0.005)	-0.101 (0.010)	-0.047 (0.007)	-0.020 (0.012)	-0.067 (0.014)	-0.071 (0.012)	-0.022 (0.013)
Degree	0.440 (0.025)	0.470 (0.037)	0.629 (0.038)	0.520 (0.042)	0.772 (0.088)	0.712 (0.114)	0.525 (0.040)	0.596 (0.045)	0.726 (0.113)
Higher	0.303 (0.020)	0.317 (0.042)	0.450 (0.031)	0.381 (0.049)	0.581 (0.044)	0.793 (0.076)	0.333 (0.041)	0.400 (0.048)	0.775 (0.078)
A levels	0.194 (0.019)	0.244 (0.028)	0.317 (0.029)	0.276 (0.040)	0.236 (0.077)	0.274 (0.057)	0.251 (0.028)	0.284 (0.040)	0.279 (0.057)
O levels	0.121 (0.013)	0.188 (0.026)	0.163 (0.020)	0.171 (0.032)	0.068 (0.021)	0.119 (0.030)	0.186 (0.026)	0.154 (0.032)	0.119 (0.030)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Children in household	0.024 (0.011)	0.052 (0.018)	-0.094 (0.016)	-0.090 (0.025)	0.005 (0.021)	-0.023 (0.041)	0.049 (0.018)	-0.058 (0.025)	-0.031 (0.042)
Employer-size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Trade union at work	0.090 (0.014)	0.095 (0.019)	0.182 (0.016)	0.202 (0.022)	0.174 (0.021)	0.239 (0.029)	0.090 (0.019)	0.195 (0.022)	0.232 (0.029)
Full-time experience	—	—	—	—	—	—	0.014 (0.006)	0.034 (0.007)	0.019 (0.006)
0.01(Full-time experience) <sup>2</sup>	—	—	—	—	—	—	-0.011 (0.012)	-0.054 (0.016)	-0.034 (0.017)
Part-time experience	—	—	—	—	—	—	-0.034 (0.014)	0.005 (0.007)	-0.010 (0.006)
0.01(Part-time experience) <sup>2</sup>	—	—	—	—	—	—	0.259 (0.058)	-0.004 (0.030)	0.042 (0.022)
Constant	-0.235 (0.078)	-0.110 (0.125)	-0.545 (0.388)	-0.439 (0.193)	-0.194 (0.116)	0.703 (0.188)	0.147 (0.185)	0.060 (0.207)	0.726 (0.206)
Sample size	4,211	1,934	1,971	1,171	1,646	829	1,934	1,171	829
R <sup>2</sup>	0.530	0.524	0.573	0.565	0.453	0.462	0.530	0.585	0.478

Note: Standard errors are given in parentheses.

## **VII. EXPLAINING THE GENDER EARNINGS GAP**

### *1. Why Do Returns to Characteristics Differ?*

If the labour market is perfectly competitive, then workers with the same marginal productivity must be paid the same wage in equilibrium. In this case, differences in male and female returns to characteristics can only be explained by a misspecification of the wage equation — for example, as a result of the omission of variables that differ systematically across the sexes. One such omitted variable is suggested by Becker (1985), who argues that women typically have less energy for work than men because of their responsibility for household tasks. Becker's effort hypothesis has been tested by Bielby and Bielby (1988) in the US and Baxter (1992) in Australia. No conclusive evidence in support of the hypothesis is found in either study. An alternative explanation for differences in returns to characteristics is discrimination, which may result in the presence of market imperfections. Imperfect information, for example, may lead employers to discriminate against women and this may adversely affect their employment, promotion opportunities and wages. Alternatively, if all employers derive utility from discrimination, discrimination may persist (see Arrow (1972), Becker (1957) and Neumark (1988) for models of discrimination). The intermediate case is, of course, where differences in returns to observed characteristics are explained partly by discrimination and partly by differences in unobserved characteristics.

### *2. Simple Decompositions*

Using Oaxaca's (1973) methodology, the gender gap can be decomposed into two components: that part of the gender gap that can be explained by differences in measured characteristics, and that part that can be explained by differences in male and female returns to measured characteristics. The theory behind the decomposition is outlined below, and the results are reported in Table 6(a) for full-time women and Table 6(b) for part-timers.

If the log wage is determined by

$$(1) \quad \log w_m = b_m x_m \quad \text{for men}$$

and

$$(2) \quad \log w_f = b_f X_f \quad \text{for women}$$

then

$$(3) \quad \log w_m - \log w_f = (b_m - b_f)X_m + b_f(X_m - X_f).$$

where  $w_m$  and  $w_f$  are male and female wages respectively,  $X_m$  and  $X_f$  are corresponding vectors of male and female characteristics, and  $b_m$  and  $b_f$  are the estimated coefficients. The first term in equation (3) tells us how much of the log(wage) gap results from differences in returns to male and female measured characteristics, while the second term tells us how much of the log(wage) gap can be accounted for by differences in measured male and female characteristics. The first term is often interpreted as that part of the wage gap resulting from 'discrimination'. We have already discussed reasons why this may not be a pure measure of discrimination. However, for simplicity's sake and in line with other studies (Oaxaca, 1973; Oaxaca and Ransom, 1994), we shall employ this interpretation.

#### Full-Time Employees

According to the GHS and BHPS wage data reported in Table 6(a), the log(wage) gap narrowed from 0.408 in 1974 to 0.318 in 1983 and 0.221 in 1992-93. Between 1974 and 1992-93, that part of the gender gap explained by differences in measured characteristics fell from 0.068 to 0.025 under the human capital specification. This tells us that, in 1974, differences in male and female skills and employment characteristics, as measured by the human capital specification, accounted for 0.068, or 17 per cent, of the log(wage) gap. By 1992-93, this differential accounted for just 0.025, or 11 per cent, of the gap. When industry, occupation and regional dummies are added, that part of the gap explained by differences in characteristics falls by a much greater amount, from 0.075 to 0.006. Adding a dummy variable for children in the household again substantially reduces that part of the gender earnings gap that can be attributed to differences in characteristics. As account is now taken of the substantial difference in male and female returns to children, that part of the gender gap that can be explained by differences in characteristics falls to 0.046 in 1974 and to -0.015 in 1992-93 (telling us that had women received the same returns to this set of characteristics as men, average full-time female earnings would actually have been greater than average male earnings in 1992-93). In 1992-93, the addition of dummies for employer size and unionisation, and of two quadratics in years of full- and part-time work experience, raises that part of the log(wage) gap explained by differences in characteristics to 0.018. The addition of the experience variables helps to reverse the negative sign on the explained part of the gender wage gap found in 1992-93 under specification (c). This is because a substantial part of the male / female difference in returns to children is explained by the tendency of women with children to have fewer years of (particularly full-time) work experience.

The average earnings ratio of full-time female employees to male employees rose from 66 to 80 per cent between 1974 and 1992-93. The most fully specified wage equation allowing comparison of these periods includes information on

TABLE 6(a)  
Decomposing the Gender Gap: All Men / Full-Time Women

	1974 (GHS)			1983 (GHS)			1992-93 (BHPS)				
	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital, SIC, SOC, region, children, trade union, employer size	Human capital, SIC, SOC, region, children, trade union, employer size, FT / PT experience
$\log w_m - \log w_f$	0.408	0.408	0.408	0.318	0.318	0.318	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (d)	Spec. (e)
$(b_m - b_f)X_m$	0.339	0.333	0.362	0.239	0.267	0.295	0.196	0.215	0.236	0.218	0.203
$b_f(X_m - X_f)$	0.068	0.075	0.046	0.079	0.051	0.023	0.025	0.006	-0.015	0.003	0.018

Note: SIC is Standard Industrial Classification; SOC is Standard Occupational Classification.

human capital, region, industrial and occupational classification and a dummy variable for the presence of children in the household. Using this specification, we find that, after adjusting for differences in characteristics, the average earnings ratio rises to 70 per cent in 1974, but falls to 79 per cent in 1992-93. Levels of and changes in these ratios are more accurate indicators of labour market discrimination. Adding additional controls for unionisation, employer size and years of full- and part-time work experience in 1992-93 tells us that even in our most fully specified model, the adjusted gender earnings ratio remains as low as 82 per cent.

Between 1974 and 1992-93, the log(wage) gap fell by 0.187. Again using the most fully specified wage equation that allows comparison of these periods, we estimate that changes in differences between male and female employment characteristics accounted for 0.061 of the 0.187 fall in the gender log(wage) gap. The remainder of the change in the gender log(wage) gap (or 0.126 of the 0.187 fall) resulted from a decline in differences in returns to male and returns to female characteristics (or a reduction in 'discrimination'). Thus falling 'discrimination' was the most important factor in reducing the gender wage gap between 1974 and 1992-93. It remains the case, however, that in 1992-93, the majority of the full-time gender log(wage) gap (85 per cent or over under all specifications) resulted from differences in returns to characteristics by gender (or 'discrimination').

We noted before that our measure of discrimination may not be a pure one, and that it may not therefore be correct to attribute the fall in the gender gap to declining discrimination. This will be the case if there has been a decline in male / female differences in unobserved characteristics that influence the wage equation. It is possible, for example, that over our period of study, male and female preferences for work have converged and that this has led to a fall in the gender gap. We will, however, have wrongly attributed any such change to declining discrimination.

#### Part-Time Employees

Part-time female employees have made less progress than full-timers in their attempt to attain earnings parity with men over the last two decades. As the results in Table 6(b) show, between 1974 and 1992-93, the log(wage) gap fell by only 0.054, from 0.480 to 0.426. The most striking result to be observed from the table is the ability of differences in male and part-time female characteristics to explain differences in earnings. While for full-timers differences in characteristics never accounted for more than 25 per cent of the log(wage) gap under any specification or in any period, results for part-timers show that up to two-thirds of the log(wage) gap can be explained by differences in characteristics. It is striking, too, that there has been no tendency for that part of the log(wage) gap resulting from differences in characteristics to narrow. Indeed,

TABLE 6(b)  
Decomposing the Gender Gap: All Men / Part-Time Women

	1974 (GHS)			1983 (GHS)			1992-93 (BHPS)				
	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital, SIC, SOC, region, children, trade union, employer size	Human capital, SIC, SOC, region, children, trade union, employer size, FT / PT experience
	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (d)	Spec. (e)
$\log w_m - \log w_f$	0.480	0.480	0.480	0.512	0.512	0.512	0.426	0.426	0.426	0.426	0.426
$(b_m - b_f)X_m$	0.422	0.265	0.262	0.420	0.295	0.293	0.335	0.308	0.302	0.251	0.143
$b_f(X_m - X_f)$	0.058	0.215	0.218	0.091	0.217	0.219	0.091	0.118	0.123	0.175	0.283

Note: SIC is Standard Industrial Classification; SOC is Standard Occupational Classification.

between 1974 and 1992-93, that part of the gap explained by differences in characteristics actually increased under the human capital specification from 0.058 to 0.091. Including demand-side variables (industry, occupation and regional dummies) further increases the proportion of the gap attributed to differences in characteristics in both 1974 and 1992-93, to 0.215 and 0.118 respectively. Adding in a dummy variable for children in the household, in contrast with the experience of full-timers, does little to explain the part-time gender wage differential further. Adding dummies for the presence of a union at work and employer size explains 0.175 of the gap, but it is the addition of quadratics for previous years of work experience that dramatically improves the explanatory power of our regressions. Differences in years of full- and part-time previous work experience raise that part of the wage gap explained by differences in characteristics to 0.283 of the 0.426 log(wage) gap. Our fullest model therefore tells us that, in 1992-93, differences between male and part-time female characteristics explain two-thirds of the part-time log(wage) gap.

For part-timers, average earnings rose from 62 to 65 per cent of the male average between 1974 and 1992-93. Again using the most fully specified wage equation allowing comparison of these periods (which includes information on human capital, region, industrial and occupational classification and a dummy variable for the presence of children in the household), we find that, after adjusting for differences in characteristics, the average earnings ratio rises to 77 per cent in 1974 and 74 per cent in 1992-93. When we add controls for unionisation, employer size and years of full- and part-time work experience in 1992-93, we find that the adjusted ratio rises even further to 87 per cent. In 1974, the adjusted earnings ratio was higher for part-time women than for full-timers, and in 1992-93, the most fully specified wage equation also shows this to be the case. This tells us that, after account is taken of differences in labour market skills and demand-side factors, part-time women actually appeared to face less 'discrimination' than full-timers in both 1974 and 1992-93. However, as the majority of part-time female workers were low-skilled, and as low-skilled workers are low-paid *and* have seen a decline in their relative earnings since the 1980s, the earnings ratio of women working part-time has shown little increase.

Again using the fullest specification that allows comparison of 1974 and 1992-93, we estimate that changes in differences in male and part-time female employment characteristics led to a 0.095 fall in the log(wage) gap. However, as differences in returns to male and part-time female characteristics widened, the log(wage) gap fell by only 0.054. We find that the change in male / part-time female differences in returns to characteristics led to a 0.040 rise in the gender log(wage) gap. Thus our measure of 'discrimination' suggests that bias against part-time working women has increased. Alternatively, this increase may reflect a rise in the penalty for working part-time or an increase in part-time female / male differences in unobserved characteristics (for example, if today's part-timers are less motivated than part-timers who worked in 1974).

### Decomposing the Full-Time / Part-Time Female Wage Gap

We have seen that since the early 1970s, earnings trends for full-time and part-time employed women have diverged sharply. Our results so far seem to indicate that this divergence has resulted from the segregation of women into two pools of labour: well-qualified women who are working full-time and the less-qualified part-timers. In Table 6(c), we decompose the full-time / part-time earnings difference into that part due to differences in observed characteristics and that part due to differences in returns to those characteristics.

The log(wage) gap between full- and part-time women increased from 0.072 in 1974 to 0.204 in 1992-93. We find that, in 1974, under the human capital specification, differences in returns to characteristics accounted for almost all of this gap. Adding dummy variables for industry, occupation, region and the presence of children reverses this, and we now find that the entire wage gap is attributed to differences in characteristics. The small size of the full-time / part-time female wage gap in 1974, however, meant that neither differences in employment characteristics nor returns to those characteristics had a large impact under any specification. Subsequent deviations in characteristics of full- and part-time employees meant, however, that by 1992-93 these differences accounted for a substantial portion of the wage gap. The power of differences in characteristics to explain the wage gap varies with the wage specification chosen. In specification (a), which includes only variables on age and education, just 31 per cent of the log(wage) gap is explained. Adding industry, occupation and regional dummies in specification (b) raises the explained portion to 70 per cent of the gap. This suggests that demand-side variables have had a greater impact on raising the full-time / part-time female wage gap than changes in age composition or education. Including a dummy variable for children in the household (specification (c)) increases the explained portion of the gap still further to 75 per cent. This reflects the negative wage penalty associated with having children and the relatively high proportion of part-time women with dependent children. In our completest specification, we add two quadratics in years of full-time and part-time work experience. Differences in full-time / part-time female work experience appear to be very important in explaining the full-time / part-time wage difference, substantially raising the explained part of the log(wage) gap to 0.249 so that it now exceeds the raw log(wage) gap. Under this specification, the contribution of differences in returns to characteristics to the log(wage) gap is negative (-0.044), implying that if it were not for differences in characteristics, part-timers would earn more than full-timers. This specification therefore suggests that part-time women face no greater labour market 'discrimination' than full-timers, and there is no indication of any additional penalty for working part-time. We have, however, seen that both demand- and supply-side factors were important in explaining the wage differential.



TABLE 6(c)  
Decomposing the Full-Time / Part-Time Female Wage Gap

	1974 (GHS)			1983 (GHS)				1992-93 (BHPS)				
	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital, SIC, SOC, region, children, trade union, employer size	Human capital	Human capital, SIC, SOC, region	Human capital, SIC, SOC, region, children	Human capital, SIC, SOC, region, children, trade union, employer size	Human capital, SIC, SOC, region, children, trade union, employer size, FT / PT experience
	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (d)	Spec. (a)	Spec. (b)	Spec. (c)	Spec. (d)	Spec. (e)
$\log w_f(f) - \log w_f(p)$	0.072	0.072	0.072	0.194	0.194	0.194	0.194	0.204	0.204	0.204	0.204	0.204
$[b_f(f) - b_f(p)] \times X_f(f)$	0.072	0.000	-0.016	0.190	0.114	0.108	0.051	0.140	0.061	0.050	0.015	-0.044
$b_f(p)[X_f(f) - X_f(p)]$	0.000	0.072	0.088	0.004	0.080	0.085	0.043	0.064	0.144	0.154	0.189	0.249

## VIII. CONCLUSION

Since the 1970s, women working full-time have experienced significant gains in their relative earnings position, with data from the Family Expenditure Survey showing a rise in their gender earnings ratio from 59 per cent to 77 per cent between 1973 and 1993. Raw earnings comparisons suggest that women working part-time have not done so well, with their average hourly earnings increasing just two percentage points to 61 per cent of the male average over the same period.

We have argued that rising wage inequality has impeded further improvements in the gender earnings ratio as a result of gender-specific changes (for example, as a result of a fall in the skills gap or a reduction in 'discrimination'). By using alternative indicators of women's relative labour market position, we can see that, while women remain clustered in the bottom half of the male earnings distribution, changes in women's position in the male earnings distribution suggest a greater improvement in their relative earnings position (particularly for part-time women) than implied by changes in average earnings ratios. For example, in 1973, 45 per cent of full-time working women and 58 per cent of part-timers earned less than or the same as the 10th percentile man. This compares with 17 and 35 per cent respectively in 1993. Similarly, the median full-time working woman had earnings equivalent to only the 12th percentile man in 1973, rising to the 35th percentile man in 1993. For part-time working women, the median woman's percentile ranking climbed from the 9th to the 16th percentile over the same period.

In order to try to explain levels of and changes in the gender earnings ratio, we use a simple decomposition technique using a range of wage equations. This decomposes the gender earnings gap into that part due to male / female differences in employment characteristics and that part due to differences in male and female returns to these characteristics. Decomposing the full-time female / male earnings gap using data from the General Household Survey in 1974 and the British Household Panel Survey in 1992-93, we find an earnings ratio of 66 per cent in 1974 and 80 per cent in 1992-93. Of this, differences in skills and employment characteristics accounted for around four percentage points of the gender earnings gap in 1974 and one percentage point in 1992-93. Thus narrowing of the skills gap accounted for just three percentage points of the 14 percentage point rise in the earnings ratio. The rest of the rise was due to a reduction in 'discrimination'. None the less, in 1992-93, differences in male and female returns to characteristics ('discrimination') still accounted for about 90 per cent of the gender earnings gap.

The segregation of women into two pools of labour (one of well-qualified women working full-time and one of less-qualified part-timers) since the 1970s is one of our most striking results. Thus, while in the mid-1970s part-time working women were as well-skilled and as well-paid as those working full-time,

by the early 1990s they lagged substantially behind full-timers in both these dimensions. Again, we use the same decomposition technique to analyse the fall in the part-time female / male and part-time female / full-time female earnings gaps between 1974 and 1992-93. The most striking result from the part-time female / male earnings decomposition is that, while differences in characteristics did little to explain the gap in earnings between full-time female and male employees, for part-timers differences in characteristics accounted for up to two-thirds of the pay gap in 1992-93. Indeed, once account is taken of differences in characteristics, we find that part-time working women have earnings equivalent to 87 per cent of those of men. This compares with an adjusted earnings ratio of just 82 per cent for full-time working women. What this suggests is that, while part-time women are low-paid because they are low-skilled, they face less 'discrimination' than full-time working women. This conclusion is reinforced by the results from the part-time female / full-time female earnings decomposition, with the entire earnings gap being attributed to differences in worker characteristics in 1992-93.

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